The

Monthly Evening Sky Map

A JOURNAL FOR THE AMATEUR — FOUNDED BY THE LATE LEON BARRITT
—NORTHERN AND SOUTHERN HEMISPHERE—

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS—APRIL - MAY - JUNE MORNING AND EVENING — AND PRACTICAL ANYWHERE IN THE WORLD

PUBLISHED QUARTERLY

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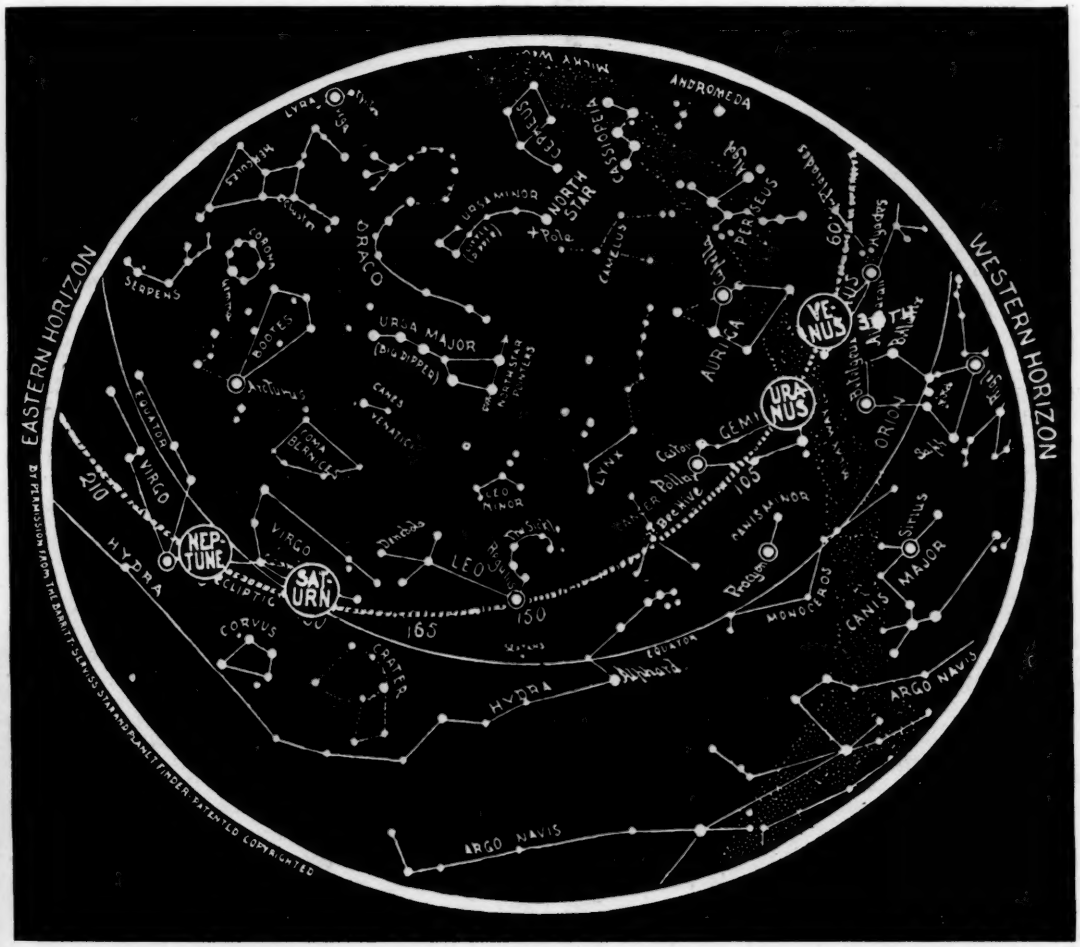
EVENING SKY MAP FOR APRIL

NORTH



SOUTH

Face South And Hold The Map Overhead. The Top North And You Will See The Stars And Planets Just As They Appear In The Heavens. The Arrow Through The Two Stars In The Bowl Of The Big Dipper Points To The North Star. The Star At The End Of The Little Dipper.

AT 9:00 P.M., APR. 1; 8:00 P.M., APR. 15; 7:00 P.M., APR. 30

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

THE SPECTROSCOPE

It is hardly possible today for even the layman, provided he is at all interested in the progress of science and tries to keep up with its steady onward march in the collection of the facts of nature and their connecting laws, to read intelligently without coming across the results of the modern instrument called the spectroscope. No article can be written that deals either with construction of the great universe and the motion of its component parts or with the construction of the minute universe we call the atom and the motion of its component electrons that must not in large measure recount the triumphs of the methods of investigation dependent upon the analysis of light. Yet to most men in the world spectroscope is nothing but a name which brings only a feeling of ignorance and mystery.

The reason for this is not difficult to find and in itself absolves them from all blame. It is in the inherent technicality of the principles upon which the instrument is founded, and which makes the explanation of its workings to one who has not had at least the rudiments of a scientific education no easy matter. But we shall here attempt it for the importance of the task gives both motive and excuse.

Light itself is a transference of energy radiating from the source in the form of minute waves in the ether which is a medium supposed to be filling all space. The little waves need not necessarily all be of the same length, but the color of the light will depend upon the wave length; all waves of the same length will give it the same color impression and no two waves of different lengths can give exactly the same color impression upon the eye.

A monochromatic beam of light would be one in which all the light is of the same wave length or color. Red is the longest wave and violet the shortest, and we may have all the different infinitesmal gradations of color and of wave length between these two limits of visible light. Ether waves of shorter length than the violet or longer than the red make no impression upon the retina of the eye, though they will readily affect the photographic plate of the very sensitive heat measuring instruments (for light and radiant heat are of the same nature). In actual figures we can say that the eye is sensitive to ether waves whose length range from .000016 inches (violet) to .000030 inches (red). A prism of glass or of any other transparent substance has the property of breaking up the beam of light which passes through it into its constituent wave lengths, spreading them out in exact order of gradation of length with the longest at one end and passing by individual sizes to the shortest. All light as we know it in nature and all artificial illuminants are mixtures of colored light rays: a proper proportion will produce upon the eye the sensation of white light. The rainbow gives such a breaking up of the white sunlight into its constituent colors with the water particles in the atmosphere acting the part of the prism.

The elementary form of a spectroscope is a glass prism with a tube to lead the narrow beam of light to it and a telescope to view the light as it emerges from the prism. The light is admitted into the tube through a very narrow slit so that it falls upon the prism in the form of a thin line of light composed of all the different colors or wave lengths which are in the light emitted by the source. The prism serves to separate out the different colors and to arrange successive monochromatic images of the thin line beam in the order of wave length. If exceedingly many different colors are present they will merge, one into its neighbors, and give the rainbow effect.

The Laws of Spectroscopy

The nature of the light given out by a light-emitting body will depend upon the physical condition and the chemical composition of the body, as the following three laws of spectroscopy show:

1. Solid incandescent bodies like red-hot iron or the white-hot tungsten in an electric light bulb give light which contains all possible wave lengths between the shortest and the longest that they emit. Between these limits there are no missing lengths, and for that reason their spectrum is called a "continuous" one.

2. Glowing gases or vapors give out light from which many intermediate wave lengths are missing so that their spectrum spread-out shows bright colors with dark spaces intervening for the missing length. This is called a bright line spectrum and is an infallible sign of glowing gaseous matter. Each particular element, gas or vaporized metal, has its own individual set of radiated colors or bright lines, so that the element from which the light has emanated can be readily recognized.

3. A third class of spectra is produced when we have a very hot glowing solid behind or surrounded by a glowing vapor which is less hot. In this case the solid alone would give us a continuous spectrum; but the vapor which alone would give us a bright line spectrum of the element or elements of which it is made up, absorbs out of the solid's continuous spectrum that very set of wave lengths which it itself would give us. The light which then reaches us shows upon analysis a continuous spectrum with black spaces for the missing lengths. From the nature of its formation this is called an absorption spectrum and from the missing or black lines we can learn the nature of the gases which did the absorbing. In this class of spectra is found the spectrum of sunlight and the black or missing wave lengths are the well-known Frauenhofer lines.

These physical laws find application of the widest kind in astronomy in enabling us to learn much concerning the physical state of the celestial bodies. The fact that the Sun's spectrum is of the third class mentioned above shows us that it must have a nucleus under pressure great enough to be practically a solid even at its enormous temperature and that this nucleus must be surrounded by an atmosphere of gases or metallic vapors. By comparing the spectrum lines given out in accordance with the second law by metallic vapors in the laboratory with the dark absorption lines found in the solar spectrum or in that of the light from a tar, we can learn the nature of the elements which are found in sun and star. Practically all the stars give out spectra of the same class as the sun, i. e., absorption spectra, showing that the physical state

is about the same though the actual elements present are very different in the different stars. However, no lines have been found in any of the stars which have not been ascribed to one of the elements existing on the earth itself. This shows a certain homogeneity throughout the known universe. But we shall say no more in this connection, as it is not the purpose of the article to recount the wonderful discoveries made with the spectroscope, but rather to indicate the principles upon which they were founded.

Doppler's Principle

A very beautiful extension of the spectrum analysis has enabled us to add to the qualitative results obtained from the above-mentioned three laws, certain other qualitative results and a whole new class of of quantitative measurements.

Take a source of light which shall send out for simplicity's sake only one color wave of monochromatic light. If we examine this beam with a spectroscope we will get just the one color line in its appropriate place. Now let us imagine the source to be set into very rapid motion in a line straight away from us. It takes a very short but definite time for a radiating source to emit the entire wave; so that if the source is a little further away from the receiver when the end of the wave is emitted than when the beginning was emitted, the wave will necessarily be a little longer. Similarly will the wave be a little shorter, if during the emission of the particular wave the source has moved toward the observing instrument. If it be the receiving instrument that moves, an analogus result is found. Moving toward the source the complete waves are picked up more quickly than when at rest and the wave-length shortened; moving away from the source it takes longer to pick up an entire wave length and the apparent wave is longer. In general we can say that if the distance between the recipient and the emitting source is increasing the wave lengths are longer for any instrument partaking of the motion and if the distance is lessening the waves are decreased in length. The former will produce a shift toward the red or longer waves and the latter toward the violet end of the spectrum. The relation between the increase or decrease of wave length and the velocity of separation or approach can be mathematically worked out and if either be known the other can be calculated.

The application of this to the measurement of the velocities of stars or other heavenly bodies follows immediately. For if upon the examination of a star's spectrum we find a set of lines that practically correspond to the lines given out by the element iron, say, but each line is shifted just a little to the red or violet, we can measure that shift and calculate from our mathematical formula the velocity. If the shift is toward the red the waves are lengthened and therefore the motion is one of separation; if toward the violet, the rays are shortened and the velocity is one of approach. These velocities are speeds in the line of sight. From a combination of the two we get the star's motion relative to the earth. By correcting for the motion of the latter the star's actual motion may be entirely known.

Sometimes upon the examination of the spectrum of a star it is found that there is one set of lines shifted to the red and another set from the same equal element shifted to the violet. This shows at once that the star is a spectroscopic binary, one star rotating about the other, one receeding from the earth and the other approaching. At a later time the same star may give a spectrum where no double shift is noticeable and this would indicate that the two components had reached turning points on their respective orbits. And so the applications of the spectroscope could be recited almost without limit, but probably enough has been said to give the general reader a little intimate knowledge of the foundation of the principle of the most wonderful instrument ever invented by man.

APRIL SKY

The great constellation of Orion with its Belt, the stars Rigel and Betelgeux and the wonderful nebula have now advanced so far toward the western horizon at the time of our map that we turn perforce to the east to see whether it is possible for the heavens to console us for their loss by the presentation to our view of other splendors. And we are in a measure rewarded by the re-appearance of certain old friends which we have missed from the evening sky for many months; it is really a fortunate arrangement which keeps certain of the stars from our view for longer periods of time, as it makes the pleasure of seeing them again so much the greater.

Down toward the southeast, below Spica, more of the sinous water snake Hydra has found its way over the horizon, so that it is practically entirely out of its cave and covers some eighty degrees of sky. It is that way the most spread out of all the groups; the brightest of its stars, Alphard, is already well past the meridian toward the west. Virgo, also, is well above the horizon, and its magnificent white luminary, Spica, is in good position for observation. Gamma Virginis is a well-known binary, telescopically double, and the two components move so perceptibly that they have been observed to close and open again in their rotation about one another. Spica, itself, is also a double star, but the telescope is not powerful enough to separate the two components, and the phenomenon is known only by means of the spectroscope.

Further to the northward of Acturus in Bootes and the fine little group of Corona Borealis, the Northern Crown. It is a well-defined circlet of stars with Gemma, a star of almost second magnitude as the principal jewel. The other stars are fainter, but their uniques position makes the constellation one of the easiest to recognize in the whole sky. In this group there flashed out some eighty years ago a new star, which was extremely bright for some days and then sank gradually into insignificance and, while still in existence to-day is well below visibility with the naked eye.

Hercules is a constellation of no great distinction. It has no very bright stars, but it has a cluster which is without rival in the sky, on a particular fine night you may be able to see it as a little hazy star in the location given by the map, but the telescope will reveal its true nature. It has been estimated that in the small patch of sky occupied by the cluster there are not less than 5,000 separate star suns.

Finally, we have Vega, the blue-white beauty of the northern heavens; it is our particular pride, for it is next to the dog-star Sirius, the brighest star in the entire firmament. So much mention has been made of this star in these pages that we will stop only to recall that it has once been and will again in 12,000 years be the pole star, and that it is approaching the earth at the rate of 8.5 miles per second, the apex of the sun's wayor, in other words, the point in the heavens toward which the sun with its attendant family is rushing is also in the constellation Lyra, but we need fear no collision. On the straight line joining the next two brighest stars of the group, Beta and Gamma Lyrae, is the famous ring nebula, for which a small telescope and good atmospheric conditions are required.

XUM

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AMATEUR'S FORUM
April, 1951

By IRVING L. MEYER, M. S.

THE SUN: continues to climb northward, moving from PISCES into Aries. Distance the 1st is 82.8 million miles and the 30th is 93.6 million miles.

THE MOON: is at apogee (farthest) the 11th at 252,000 miles; at perigee (nearest) the 23rd at 225,000 miles.

The Moon's Phases (E. S. T.):

New Moon	April 6 at	5:52 AM
First Quarter	April 14 at	7:555 AM
Full Moon	April 21 at	4:30 PM
Last Quarter	April 28 at	7:17 AM

MERCURY: remains in the Pisces—Aries region all month, starting as an evening star but entering the morning sky the 24th. Greatest elongation east of the Sun, 19° 12', on the 5th means that this elusive planet can be seen shortly after sunset, low in the west, for the first week or so of the month. At about this date, magnitude is 0.0, apparent diameter 7", and the planet will appear half illuminated (like the Moon at quarter phase). Minimum distance, the 28th, is 52 million miles.

VENUS: travels to a point high in the northern heavens to the northeast of Aldebaran, in Taurus. It is well placed for observation in the evening sky. At the middle of the month magnitude is 3.5, apparent diameter is 13.6", distance is 115 million miles, and, telescopically, the planet appears gibbous, being about 80% luminated as seen from the earth.

MARS: is in the evening sky setting close on the heels of the Sun from Pisces and Aries. Too close to the Sun to be observable. Distance increases from 222 to 229 million miles.

JUPITER: is in the morning sky in Pisces, too close to the Sun for satisfactory observation. Distance the 15the is 543 million miles.

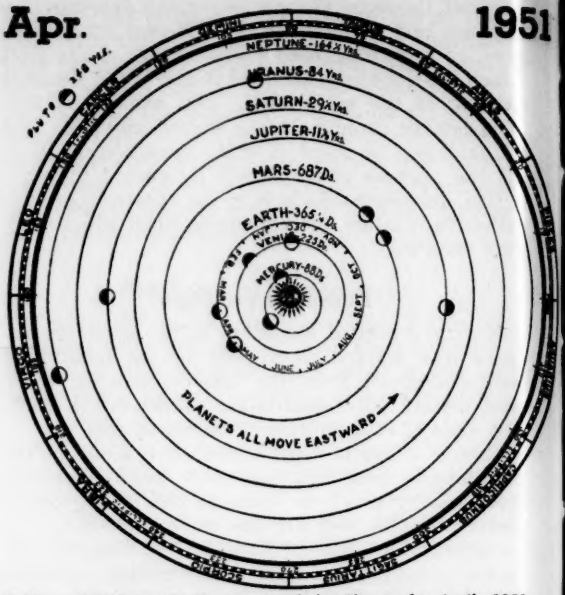
SATURN: holds sway in the evening sky from a point slightly north of the equator in Virgo. It is a beautiful object either to the naked eye, or preferably, as seen in the telescope. The rings are nearly level, but at this time the planet's marked polar flattening is readily noticeable as are the cloud bands across the disc. Distance the 15th is 798 million miles.

URANUS: in Gemini, and though well placed for observation, is beginning to slip from the evening sky. Best seen with optical aid, it can be seen with the naked eye on a moonless night, however. Distance the 15th is 1780 million miles.

NEPTUNE: come to opposition the 8th in Virgo. A telescopic object only, its opposition magnitude is 7.7. A telescopic power of 100 diameters will reveal its 2⅝" diameter disc; good binoculars will reveal the planet as a starlike point. Minimum distance, the 10th is 2722 million miles.

IN SELECTING YOUR GIFTS, INCLUDE A SUBSCRIPTION TO THE "MONTHLY EVENING SKY MAP" FOR YOUR FRIENDS. IT WILL BRING THEM A YEAR OF INTELLECTUAL PLEASURE, AND LAY THE FOUNDATION OF A LIFETIME OF INTELLIGENT OBSERVATION OF THE HEAVENS IN YOUNG PEOPLE.

Apr. **1951**



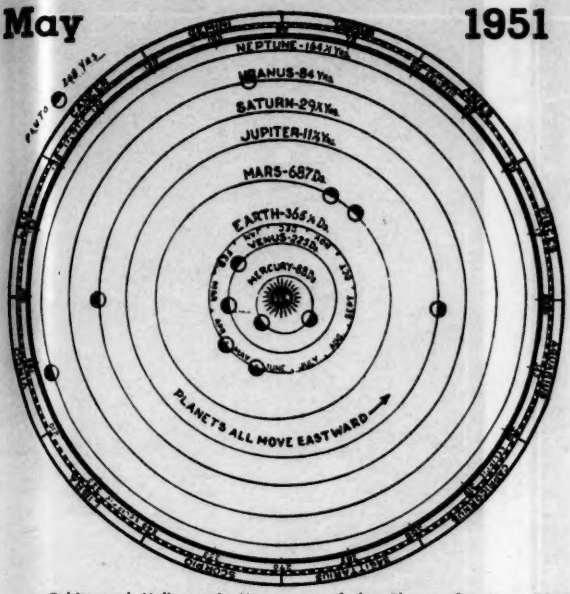
Orbits and Heliocentric Movements of the Planets for April, 1951
NOTE: The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month, are given for Mercury, Venus and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus and Neptune are shown in the mean position for the current month.

PLANETARY CONFIGURATIONS
Eastern Standard Time
April, 1951

Apr.	4— 6:35 PM	Conunction, Jupiter and Moon; Jupiter south 1° 56'.
Apr.	5— 3:00 PM	Mercury greatest elongation east, 19° 12'.
Apr.	6— 1:00 AM	Mercury greatest heliocentric latitude north.
Apr.	7— 7:25 AM	Conjunction, Mars and Moon; Mars south 3° 54'.
Apr.	7— 9:26 PM	Conjunction, Mercury and Moon; Mercury south 1° 1'.
Apr.	8— 3:00 PM	Opposition, Neptune and Sun.
Apr.	9— 7:53 AM	Conjunction, Venus and Moon; Venus south 3° 57'.
Apr.	12— 7:22 PM	Conjunction, Uranus and Moon; Uranus south 4° 39'.
Apr.	14— 5:00 PM	Mercury stationary in Right Ascension.
Apr.	19— 3:00 AM	Conjunction Mercury and Mars; Mercury north 2° 51'.
Apr.	19— 9:13 AM	Conjunction, Saturn and Moon; Saturn north 3° 42'.
Apr.	20— 9:42 PM	Conjunction, Neptune and Moon; Neptune north 4° 43'.
Apr.	24—11:00 PM	Inferior conjunction, Mercury and Sun; Mercury north 1° 16'.
Apr.	25— 9:00 AM	Venus in perihelion.
Apr.	29—11:00 AM	Mercury in descending node.

PLANETARY CONFIGURATIONS
Eastern Standard Time
May, 1951

May	1—10:00 AM	Mars in ascending node.
May	2— 1:03 PM	Conjunction Jupiter and Moon; Jupiter south 2° 42'.
May	4— 5:07 PM	Conjunction Mercury and Moon; Mercury south 5° 13'.
May	6— 7:52 AM	Conjunction Mars and Moon; Mars south 4° 38'.
May	7— 6:00 AM	Mercury stationary in Right Ascension.
May	9—12:08 PM	Conjunction, Venus and Moon; Venus south 2° 44'.
May	9— 6:00 PM	Mercury in aphelion.
May	10—4:27 AM	Conjunction, Uranus and Moon; Uranus south 4° 27'.
May	16— 4:58 PM	Conjunction, Saturn and Moon; Saturn north 3° 41'.
May	17—12:00 AM	Conjunction, Venus and Uranus; Venus north 2° 5'.
May	17— 6:00 AM	Venus greatest heliocentric latitude north.
May	18— 7:00 AM	Conjunction, Neptune and Moon; Neptune north 4° 45'.
May	22— 9:00 AM	Conjunction, Mars and Sun.
May	22—12:00 PM	Mercury greatest elongation west, 25° 24'.
May	29— 8:00 PM	Saturn stationary in Right Ascension.
May	30— 2:00 AM	Mercury greatest heliocentric latitude south.
May	30— 5:22 AM	Conjunction, Jupiter and Moon; Jupiter south 3° 30'.



Orbits and Heliocentric Movements of the Planets for May, 1951
NOTE: The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month, are given for Mercury, Venus and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus and Neptune are shown in the mean position for the current month.

AMATEUR'S FORUM
May, 1951

By IRVING L. MEYER. M. S.

THE SUN: moves from Aries to a point high in the northern heavens in Taurus. Distance the 1st is 93.6 million mies and the 31st is 94.2 million miles.

THE MOON: is at apogee the 9th at 252,000 miles and is at perigee the 21st at 223,000 miles.

The Moon's Phases (E. S. T.):

New Moon	May 5 at 8:35 PM
First Quarter	May 14 at 12:32 AM
Full Moon	May 21 at 12:45 AM
Last Quarter	May27 at 3:17 PM

MERCURY: is in the morning sky all month, in Aries. Greatest elongation west of the Sun, 25° 24' on the 22nd, will make this planet observable in the late morning sky just before sunrise, and low in the east. At this time it is somewhat brighter than a standard 1st magnitude star, and appears half illuminated in the telescope. For telescope users who have setting circles, this planet can be best observed in daytime. Distance increases from 53 million miles to 90 million mies.

VENUS: moves through the evening sky from Taurus to Gemini, and passes 2° north of Uranus on the night of the 16th. Superbly located for observation from the northern hemisphere, this planet is by far the brightest starlike object in the sky. During the month it comes closer to the earth (from 105 to 85 million miles) with corresponding increases in brightness (magnitude 3.5 to 3.7), and apparent diameter (from 14.8" to 18.5"). In the telescope it appears gibbous

MARS: is in conjunction with the Sun the 22nd, and enters the morning sky Moves from Aries into Taurus, but is too close to the Sun to be observable. Distance the 1st is 230 million miles and the 31st is234 million miles.

JUPITER: in Pisces, is now observable in the late morning sky. Though a very remote planet (distance the 15th is 518 million miles), it is so huge that it is always a brilliant object. This month magnitude averages 1.7 and diameter 35". The four bright satellites can be seen with binoculars or opera glasses.

SATURN: is moving slowly in Virgo in the evening sky, setting after midnight. A bright object, it is of particular interest to telescope users. Several of the satellites can be picked out (Titan, the largest, can be seen with the smallest telescopes), but the rings this year are not to widely interesting as they are not widely opened. Distance from the earth the 15th is 829 million miles.

URANUS: is an evening sky object in Gemini, but rapidly being overtaken by the Sun. Sets shortly after the Sun at the end of the month. Distance the 15th is 1819 million miles.

NEPTUNE: north-west of Spica in Virgo, this planet is just past opposition, and can be observed most of the night. It is faint, however, being only of the 8th magnitude, and not visible without optical aid.

How North Becomes South When Pole Is Reached

"In what direction does north lie when a man is at the pole?" asks a reader.

Two things may result from overmuch thinking on such questions: (1st) it may make you crazy; (2nd) it may lead you into Einsteinism. Perhaps from a practical point of view these results are less unequal than they seem.

However, the "relativity" involved in this particular case-that of the meaning of the terms "north" "south" "east", and "west"—is easily understood without any excursion into metaphysical philosophy. There are two ways of considering direction, as indicated by "the points of the compass." The ordinary way is to refer it entirely to the earth's surface. Thus for everybody the everday meaning of "North" or "South" is toward the corresponding pole or end of the earth's axis of rotation. "East and West" are directions over the earth's surface at right angles to north or south, or parallel to the equator.

Unaware Of Circle

As long as you do not project your mind to an indefinite distance beyond the visible horizon no confusion arises. You go West, or you go East, and always west or east is straight ahead of you. But if you go, in our latitude, about 19,000 miles either west or east you find that you have passed around a circle and come back again to your starting point. The circle was so big that you were unaware that you were traveling in it; it seemed always a straight line.

Now compare the way you were facing when you started with the way you were facing when you were half-way around the earth; you perceive, mentally, that those directions must have been exactly opposite to one another, although when referred to the surface of the earth at each point of observation, they were both the same direction. Thus you see that the line of direction which we call, for instance, from west to east, really means the locus of a point which is continually moved eastward on the earth's surface and this, on account of the earth's shape, is necessarily a circle.

Next suppose yourself to go direct toward the North Pole. Then the "locus" i. e., the line is generated by your motion over the earth, will again be a circle. But it leads to a somewhat startling result.

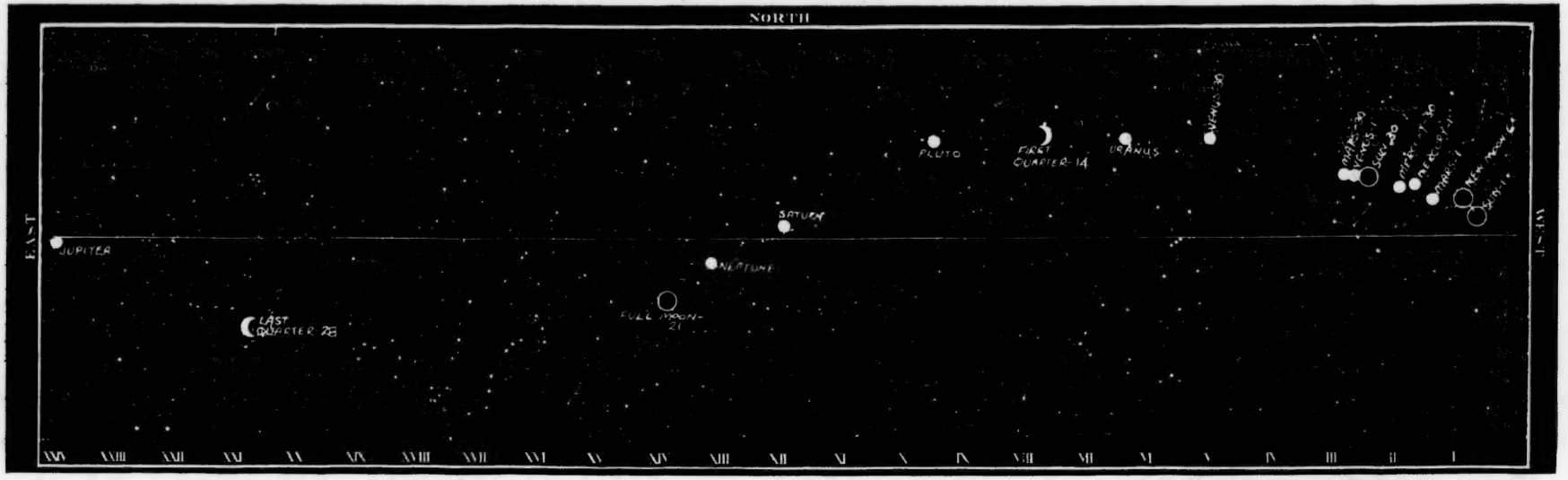
Only One Direction

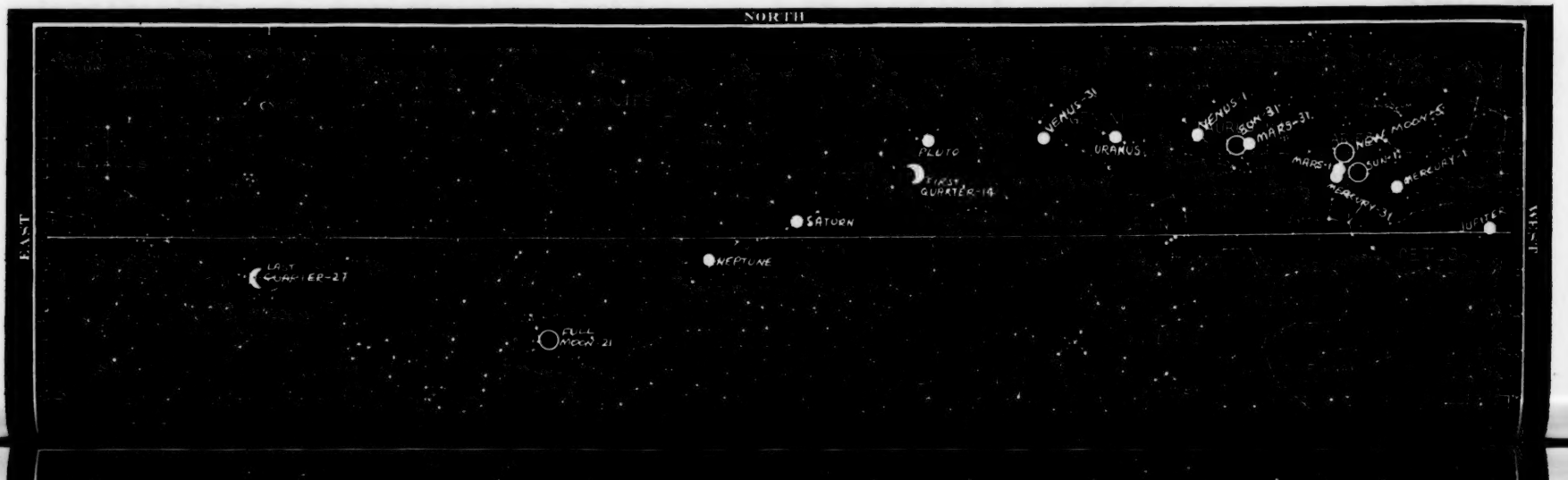
When you have followed it to the pole, instantaneously the direction changes. North vanishes, or loses its identity, and becomes south, as you stand on the pole every direction on the earth's surface is south, and only south, when you walk over the pole, keeping straight, on, your direction suddenly changes from north to south, although the locus is in no way affected; you are still following the circle, and without reversal, but the instant after you have crossed the pole "north" springs into existence again behind you.

In one way you could still have a "north" even when standing on the pole, and that is by freezing the idea of direction from all reference to the earth's surface and making its locus a straight line parallel to the earth's surface and extending on indefinitely through outer space. Then, as you stood on the pole, north would be directly above your head. It would be indicated by the celestial pole, or pole of the axis on which the heavens appear to revolve around the earth. In fact, we are obliged, in making our way over the earth with the aid of the points of the compass, to refer to the sun and the stars as a basis. If there were so much distant, and relatively fixed, objects to refer to we could not, by direct observation, detect the rotation of the earth, or determine the location of its poles.

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50 DEGREES NORTH AND 65 SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view.
Practical as a Star, Constellation and Planet Finder for the cu rrent months— April-May-June, 1951—Anywhere in the world.
Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at it's several phases.





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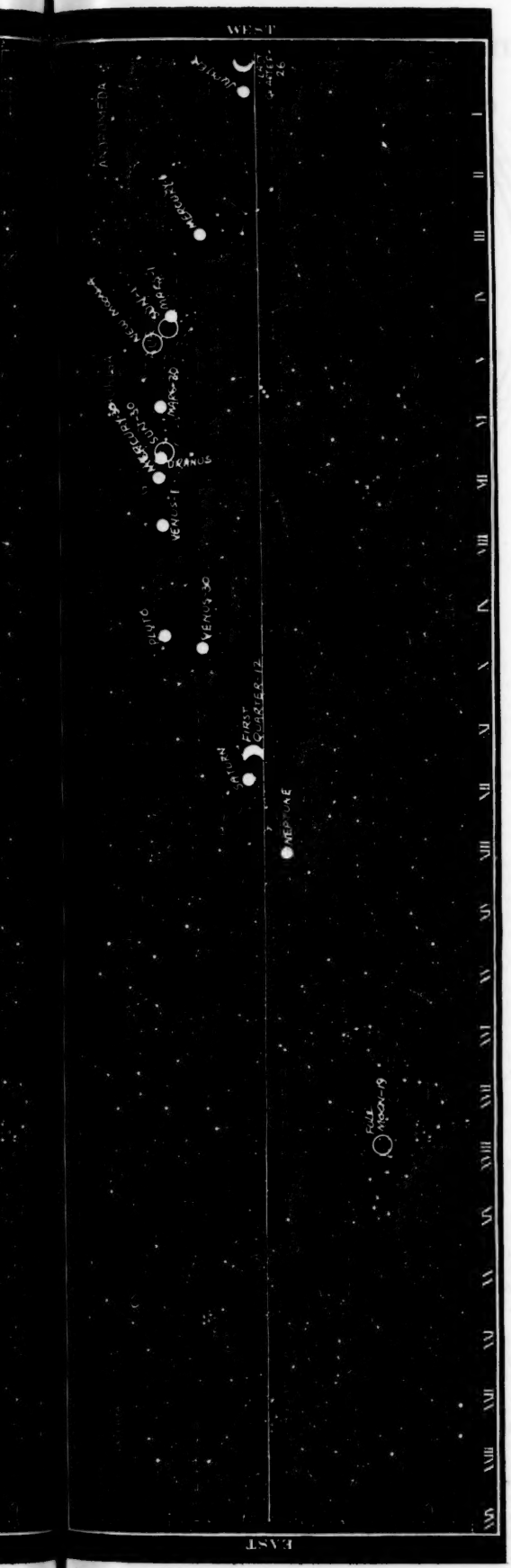


Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDIAN—DUE SOUTH—AT 9 P. M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.

TESTS OF THE MAGNETIC FIELD THEORY

The first test of this theory was in 1939 when Jupiter's field acted from the south causing a hot dry spring eruption of Mt. Vesuvius and earthquake in Turkey.

In 1951 we will have some very unusual weather, magnetic storms, sun spots and meteor display, due to the planets Saturn, Jupiter and Venus.

Saturn's field will act from the north March 5th to 10th. The Earth and Saturn will be moving in the same direction and the earth will be in Saturn's field for nearly a week. March 11th, the Moon will act from the north. This will cause exceptionally cold stormy weather in the West-Central states, interference with telephone, radio and television. Eruption of volcanoes and earthquakes in South America. (West Coast). April 23rd to 25th, Saturn's field will sweep over the Sun causing sun spots.

April 20th, Jupiter's field will sweep over the earth, action will be from the South, causing hot dry weather on the Pacific Coast and violent earthquakes in California. Eruption of volcano in the northern hemisphere, possibly in Iceland. June 3rd a phenomenon will occur which hasn't happened before and probably will not happen again. The fields of the giants Saturn and Jupiter acting in opposite directions will cross each other, with Venus and Mercury caught in a turmoil. Saturn will be at 181 degrees heliocentric latitude, Venus 193 degrees, Mercury 331 degrees, Jupiter 357 degrees, and the Earth at 251 degrees. The fields of two major and two minor planets will all be parallel and in a line between the sun and the Earth.

180—SUN—360

SATURN 181 VENUS 193 MERCURY 331 JUPITER 357 EARTH 251

Several questions arise:

Will the Sun's rays be able to pass thru these fields? Will the Sun's rays be deflected and cause unusual weather? What influence will these fields have on the Sun's rays?

There will be a great meteor display. Will we get a new member to the solar system? Will we lose a member of the solar system? Will Venus and Mercury keep to their course- What influence will these fields have on the ecliptic (Sun's field)? Will it cause a wave motion? What effect will it have on the Earth?

June 20th, Jupiter's field will sweep over the Sun causing Sun spots and great solar prominences on the northern hemisphere.

August 15th, Saturn's field will again sweep over the earth, action from the north.

August 15th to 25th, Venus moves from 305 to 325 degrees and the Earth from 321 to 331 degrees heliocentric longitude during which time the earth will be continuously in Venus' field. Action from the North. This will cause exceptionally cold stormy weather during the last of August in the Central states.

A check of these phenomena will prove the "Magnetic Field Theory."

W. C. EWERT,
Chicago, Ill.

THE MOON'S LIBERATION

The Moon always keeps the same face turned toward the earth. This is true in a general way, but the statement is not quite exact. The Moon's equator is inclined 6½° to the plane of its orbit, consequently at one time in each month its north pole is tipped 6½° toward us, and two weeks later its south pole is similarly tipped. Therefore we see a little beyond first one pole and then the other each month. This slight variation we call the liberation in latitude. Further, since the Moon's orbit is an ellipse its motion in its orbit will be variable, being slower when its farthest from the earth and faster when it is nearest; but its motion of rotation on its axis is perfectly uniform. This produces what we call the liberation in longitude and permits us to "see alternately a few degrees around the eastern and western edge of the lunar globe." Finally the Moon when it rises and when it sets is practically on a plane passing through the center of the Earth while we are about 4,000 miles above that plane; therefore we look a little past the western limb as it sets. The net results is that 41/100 of the Moon is always visible 41/100 is never visible, and the remaining 181/00 along the limbs, is sometimes visible and sometimes not.

XUM

Question & Answer Department

Jean Hendricks writes: "(a) What forces have produced the greatest inclination of the earth's axis and are they still at work?

(b) How are star distances and the speed at which stars are traveling computed by means of the spectroscope?

(c) Can you suggest a line of home study in mathematics of astronomy for an amateur with a 4" refractor who only went as far as to finish elementary algebra in high school and has just about as good as forgotten even that much?

ANS.— (a) Neither the Nebular Hypothesis nor the Planetesimal Hypothesis give a clear explanation of the inclination of the planets' rotation plane to the plane of their revolution about the sun. If the planets were thrown off or left behind first in the shape of rings as is postulated by the Nebular Hypothesis, we should expect the motion of ritation to be in the same plane with the ring and therefore the rotation of the axis should be at right angles to the plane of the revolution. On the Planetesimal Hypothesis the planets are the results of unions and condensations of particles shot out from the sun and on this hypothesis it may be easier to account for the phenomenon. This idea would also favor the planes of the ecliptic and equator coinciding, but some particle union or collision of the primal matter rotating about the central sun may have produced the displacement. In any event the probability is that the forces which directly produced the inclination of the two planes does not now exist trying directly to increase the angle; on the other hand, the gravitational force of the sun, moon, etc., is trying to swing the plane of the equator into the plane of the ecliptic, producing thereby the phenomenon called Precession of the Equinoxes and other pertubations.

(b) We refer you to the article on the spectroscope in this month's issue. The distance of the stars has been spectrosocopically measured by comparing the apparent magnitude of the stars with estimates of the absolute magnitudes made from relative intensity of certain lines in the star's spectrum.

(c) It is quite impossible to attempt anything mathematical in astronomy without a good knowledge of trigonometry, plane and spherical. With a four-inch refractor you would not have much opportunity for the use of mathematics anyhow; it seems to us that your opportunity lies in the feild of variable stars.

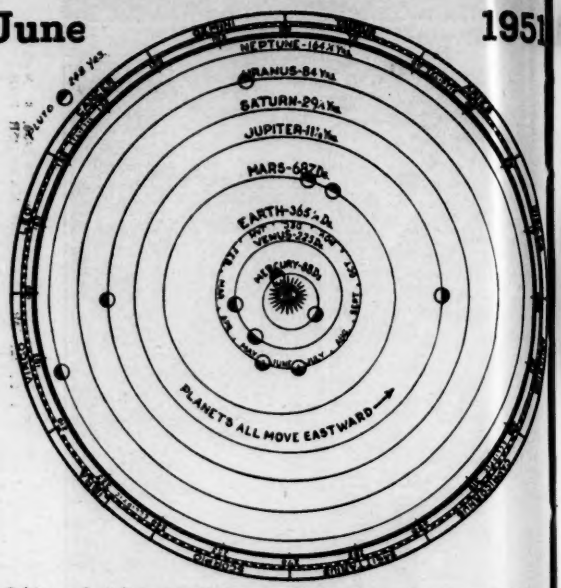
William Bentley writes: "Will you please explain what is meant by fixed stars? Are they suns? Are they stationary or do they move around some center; if so, in what sense are they fixed?"

ANS:—The "fixed" stars are the celestial bodies which are outside of the solar system and whose positions relative to one another show no change to the unaided eye during periods of observation extending even over centuries. This name excludes, of course, the sun, moon, the planets, as Saturn, Jupiter, Earth etc. and comets. The fixed stars are suns inasmuch as they are glowing bodies in space which send out light and heat. When their positions are carefully determined with the most delicate instruments of precision it is found that they show motions which are in themselves very rapid but which appear so minute to us simply because of the enormous distance which separates the stars and the earth.. They certainly are all in motion in space about the common center of gravity of all the stars, and the term fixed is used simply to distinguish them from the bodies of the solar system whose motions are really apparent to the naked eye. The ancients first applied this term and it has persisted because of its great convenience.

Albert Jennings writes; "What is the generally accepted explanation of the so-called 'Dark Days'? I refer to the class of dark days of which May 1780, was a notable example."

ANS.—"A dark day" is one on which the sun's light is dimmed by atmospheric conditions and it is not due to any change in the sun itself. On the date mentioned by you a particularly large and heavy cloud shut off the sunlight and darkened the entire area of New England. Another "dark day" occured in August 1880.

June 1951



Orbits and Heliocentric Movements of the Planets for June, 1951

AMATEUR'S FORUM

By IRVING L. MEYER, M. S.

June, 1951

THE SUN: moves from Taurus into Geminin, at geocentric distances increasing from 94.2 on the 1st to 94.4 million miles on the 30th. The Sun enters the *sign* of Cancer the 22nd, marking the solstice.

THE MOON: is farthest from the earth the 5th at 253,000 miles and is closest the 19th at 222,000 miles.

The Moon's Phases (E. S. T.):

New Moon	June 4 at 11:40 AM
First Quarter	June 12 at 1:52 PM
Full Moon	June 19 at 7:36 AM
Last Quarter	June 26 at 1:21 AM

MERCURY: moves from Aries, through Taurus and into Gemini. It starts the month as a morning star, but on the 25th is in superior conjunction with the Sun and enters the evening sky. It is not well placed for observation at any time during the month. Maximum geocentric distance, the 27th, is 123 million miles.

VENUS: moves from Gemini through Cancer into Leo, and is very well placed for observation. On the 25th it reaches greatest elongation east of the Sun. 45° 25', and at magnitude 3.9, reigns supreme. On that same date the planet is exactly one-half illuminated (as seen from the earth) and will look in the telescope like the Moon at quarter. On the 1st distance is 84 million miles and apparent diameter is 18.6"; on the 30th, 62 million miles and 25.4".

MARS: in the morning sky in Taurus, is too close to the Sun to be observable. Greatest geocentric distance occurs the 27th at 236 million miles.

JUPITER: just north of the equator in Pisces, rises about midnight and is beginning to become a prominent object. It is a bright, interesting planet, with four bright moons which can be seen in opera glasses. Still several months from opposition, but brightening and approaching the earth. Distance the 15th is 479 million miles.

SATURN: also just north of the equator, but in Virgo, sets at about midnight. It still is an interesting object in the telescope, particularly the ring system. But this year the ring is a more difficult object to discern since it is nearly level as seen from the earth. At the middle of the month, the ring's apparent diameter is 40"; its width only .8". At this same time magnitude is 1.3 and distance 874 million miles.

URANUS: in Gemini, virtually disappears from the evening scene Too close to the Sun all month to be observab'e. Distance the 15 the is 1842 million miles.

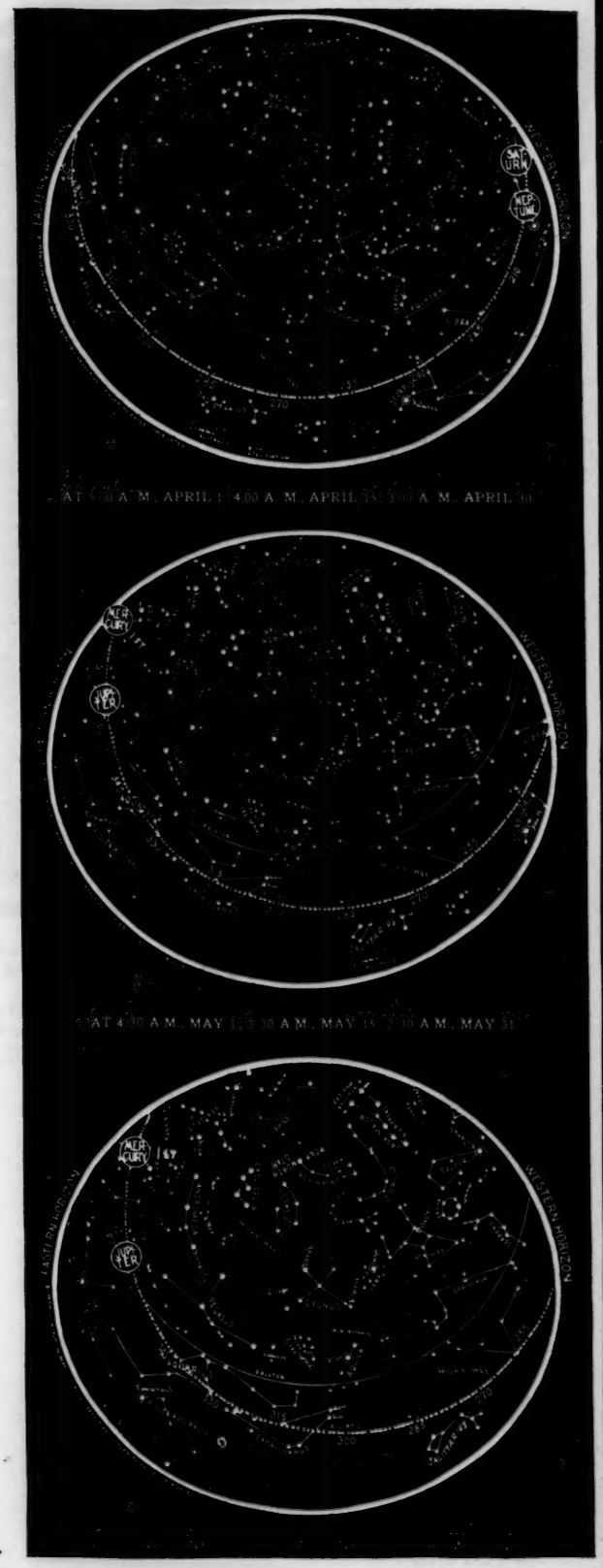
NEPTUNE: is in Virgo and still well placed for observation. But it is a faint planet (8th magnitude) and cannot be seen without optical aid. Distance the 15th is 2775 million miles.

HOBBIES

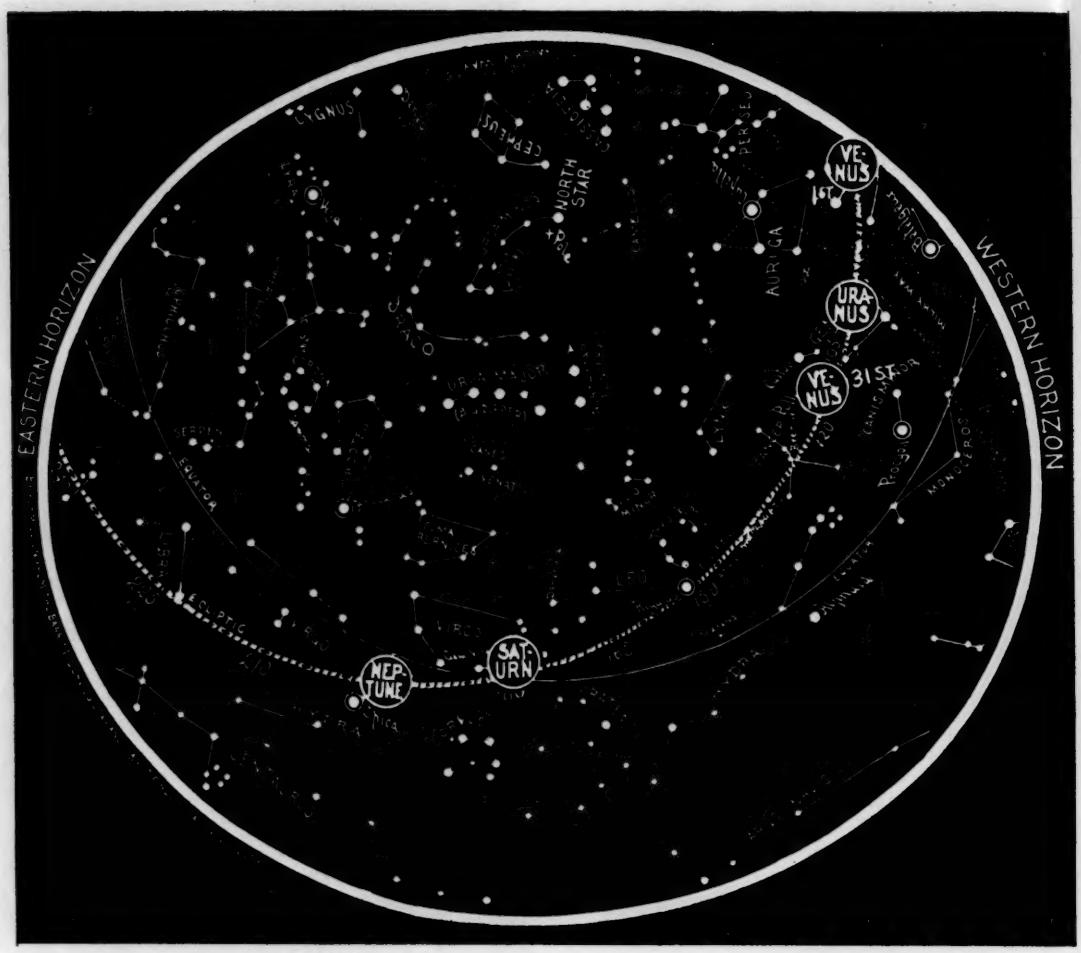
Have you a hobby? I have mine.
And dearly do I love it.
I hold it as a gift divine,
And prize few things above it.
It bears me through the trials of life,
Despising sham and shoddy,
And tones me up for all its strife,
In health of soul and body.
It carries me o'er land and sea,
From frozen pole to line..
Fleet as the lightning and as free
It owns no will but mine.
The cares that crush me by their weight
Are but my balance wheel:
Life's duties are my precious freight,
To keep an even keel.
I pity all who fret and grieve,
And run a killing pace
To clutch the bauble they must leave
When they have won the race.
I envy not the rich and great
Who pine in palace halls,
I covet not the proud estate
Where sensuous pleasures pall.
I crave not wealth's luxurious home,
A wider range is mine;
I live beneath the frescoed dome
Whose artist is divine.
And when he draws the purple shades
About the setting sun,
And scatters gems in bright cascades
Where crystal streamlets run.
And shining sands of silver streaks
The amethyst lagoon,
High overhead of gilded peaks
He hangs the crescent moon,
And when the curtains overhead
Shut out the light of day,
And star-dust o'er the heavens is spread
To pave the Milky Way—
I turn from gross material things
That fret like prison bars,
And mount my steed with spirit wings,
And roam among the stars.
And view God's mantle vast and grand,
With orbs that interlace;
Like gems thrown from a lavish hand,
Upon the floor of space.
Arise, O miniature of God!
Aspire to lofty things,
Even though thy feet be leaden shod,
A living soul hath wings.
Look out upon the infinite,
And wave thy pinions free,
Look where in myriad orbs of light
His many mansions be.
There! are the recreation fields,
Where lofty souls may roam;
Wherever God his sceptre wields
His children are at home.
O think not the Creator's power
Spent on this little sphere:
The wealth of our Celestial dower
May be enjoyed while here.
So mount your hobby if you will,
Your fancies to pursue.
But here you owe some duties still——
See that it don't ride you!
Men have their fancies and their freaks,
But this is worth the knowing—
The trend and course your hobby seeks
Determines where you're going.

—George Taylor

MORNING SKIES FOR APRIL – MAY – JUNE


AT 5:00 A. M., APRIL 1 4:00 A. M., APRIL 15 3:00 A. M., APRIL 30
MERCURY
JUPITER
WESTERN HORIZON
AT 4:00 A. M., MAY 1 3:00 A. M., MAY 15 2:00 A. M., MAY 31
MERCURY
JUPITER
EASTERN HORIZON
WESTERN HORIZON

EVENING SKY MAP FOR MAY



AT 9:15 P.M., MAY 1; 8:30 P.M., MAY 10; 7:45 P.M., MAY 21.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

Lunar Occultations of Stars

The moon on its monthly orbital round of the heavens interposes its massive bulk between us and the stars which occupy the projection of its path on the celestial sphere. The moon is the nearest body to us, and when it gets in the straight line between us and any other heavenly body the latter suffers a temporary eclipse. While, in the case of stars, this happens many times a night, the number of really bright objects which can be so occulted is small enough to make this phenomenon quite a rare one for observation without telescopic aid.

Besides the use made of these ocultations in the navigation of previous times, the scientific fact that the moon can have no atmosphere or at most an extremely tenuous one is learned from the sudden and not gradual disappearance and reappearance of the occulted stars.

CORRECTION

Please take note that on page ten of the last issue, there is a poem "WINTER SKY" the author of this poem is "BELLE W. FERRELL' 932 Tendilla Ave.., Coral Gables, Florida. The name "BILLIE" is just a printers error.

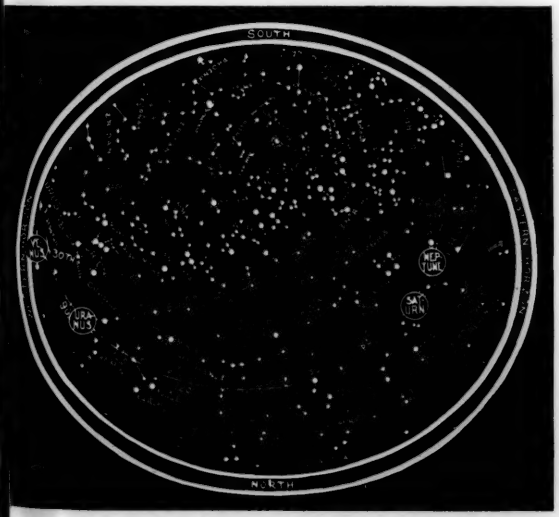
MAY EVENING SKIES

The Stars and Constellations

Orion and his great cortege of brilliant constellations have now virtually disappeared from the evening sky, and the summer constellations are beginning to take their places. The whole length of the enormous Hydra can now be seen, stretching across the southern sky, starting with the diamond-shaped head under the Beehive cluster in Cancer, and running under Leo, Crater, Corvus, and Virgo, nearly to the eastern horizon. His brighest star, the lone Alphard, exhibits a reddish color. Below the central and fore parts of his elongated body may be seen some of the stars in the rigging of the ship Argo, and below his tail some of the stars of Centaurus. Virgo is very conspicuous in the southeast, especially on account of the beauty of its chief star, the pure white Spica. The situation of the celebrated binary, Gamma Virginis, is indicated on the chart. This is well worth looking at with a telescope. The two stars composing it are each of about the third magnitude, and their distance apart is a little less than six seconds of arc. They revolve about their common center of gravity in a little less than 200 years. A 3-inch telescope shows them beautfully. Above Virgo

the glimmering cluster in Coma Bernices is conspicuous, and east of it glows great Artcurus, one of the most brilliant of the fixed stars, and the brightest in the constellation Bootes, the Bear-Driver, who seem to be pursuing the Great Bear, Ursa Major (the Great Dipper), around the pole. Everybody must sympathize with the exclamation of Carlyle about the delight of watching "Bootes driving his hunting dogs across the zenith in their leash of sidereal fire." The dogs are represented by the little constellation of Canes Venatici, under the handle of the Great Dipper, which is now almost overhead north of the zenith. Among other constellations particularly beautiful at the present time is Corona Borealis, which may be seen, with its almost perfect circle of stars, northeast of Arcturus. Away over in the northeast Lyra is seen rising with the glittering Vega, which is as bright as Arcturus, but strikingly different in color, its rays being blue white while Arcturus is orange or at, times almost red. Both of these stars are of immense actual magnitude. Arcturus probably exceeding our sun at least 1,000 times in brightness while Vega is hardly less enormous. But Vega is apparently young in the order of evolution, and Arcturus is old, older than the sun. Between Corona Borealis and Vega appears the constellation Hercules, forever memorable from Sir William Herschel's discovery that it lies ahead of us in the path which the Solar System is pursuing straight toward the north, at the rate of more than 300,000,000 miles per year. Later studies have shown that the real direction of this vast flight is rather nearer to Vega than to the central part of Hercules. There is a good deal of mystery about the origin of the constellation Hercules. Among the ancient Greeks it was called "The Phantom" and "The Man Upon His Knees." Leo, in mid-heaven, is well marked for observation, the figure of the Sickle is clearly marked and the leading star Regulus, at the lower end of the handle, is not only bright but it is important, being one of the "nautical stars" employed by sailors in finding their longitude at sea. There is a well-known meteor shower in May, known as the Aquarids, because they radiate from the constellation Aquarius. As that constellation does not rise before midnight these meteors, if any are seen in the evening, will appear shooting up from the horizon in the northeast. They are visible from the 1st to the 6th of the month. They move swiftly, making streaks in the sky, which usually vanish almost instantly. Bolides, or fireballs, not belonging to any meteor shower may make their appearance at any time. A most wonderful one was seen in England on the evening of February 22, 1851. It left a glowing trail which remained visible more than two hours.

EVENING SKY SOUTHERN HEMISPHERE



AT 8:45 P. M., APR. 1; 7:45 P. M. APR. 15; 6:45 P. M., APR. 30.

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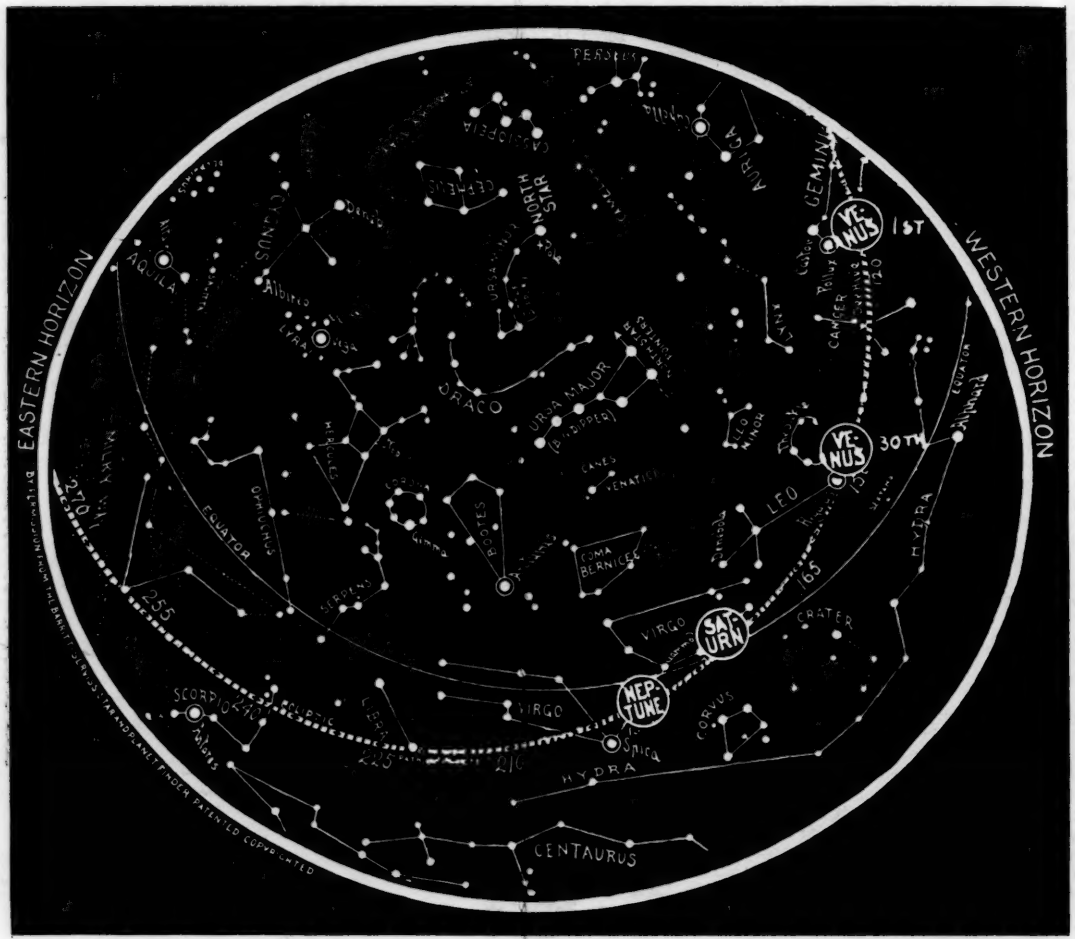
PLANETARY CONFIGURATIONS

Eastern Standard Time

June, 1951

June 2— 3:51 PM Conjunction, Mercury and Moon; Mercury south 7° 28'.
June 4— 5:58 AM Conjunction, Mars and Moon; Mars south 4° 41'.
June 6— 1:32 PM Conjunction, Uranus and Moon; Uranus south 4° 16'.
June 8—12:58 PM Conjunction, Venus and Moon; Venus south 1° 4'.
June 13— 1:30 AM Conjunction, Saturn and Moon; Saturn north 3° 52'.
June 14— 3:52 PM Conjunction, Neptune and Moon; Neptune north 4° 56'.
June 17— 4:00 PM Quadrature, Saturn and Sun.
June 18— 3:00 AM Mercury in ascending node.
June 19—10:00 AM Conjunction, Mercury and Mars; Mercury south 0° 16'.
June 22—12:25 AM Sun enters Cancer; solstice.
June 22— 6:00 PM—Mercury in perihelion.
June 25— 9:00 AM Superior conjunction, Mercury and Sun; Mercury north 1° 10'.
June 25—12:00 PM Venus greatest elongation east, 45° 25'.
June 26— 7:34 PM Conjunction Jupiter and Moon; Jupiter south 4° 14'.
June 28— 5:00 AM Conjunction, Mercury and Uranus; Mercury north 1° 10'.
June 29— 7:00 AM Neptune stationary in Right Ascension.

EVENING SKY MAP FOR JUNE



AT 9:00 P.M., JUNE 1; 8:00 P.M., JUNE 15; 7:00 P.M., JUNE 30.

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EVENING SKY SOUTHERN HEMISPHERE

AT 8:45 P.M., MAY 1; 7:45 P.M., MAY 15; 6:45 P.M., MAY 28.

EVENING SKY SOUTHERN HEMISPHERE

AT 8:45 P.M., JUNE 1; 7:45 P.M., JUNE 15; 6:45 P.M., JUNE 30.